EXAMINER'S AMENDMENT

An examiner's amendment to the record appears below. Should the changes and/or additions be unacceptable to applicant, an amendment may be filed as provided by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview with Rodney D. DeKruif (Reg. No. 35,853) on March 10, 2009.

The application has been amended as follows:

In the claims:

1. (Currently Amended) A complexed nanoparticle composite comprising a metallic nanoparticulate substrate component, a polymeric ligand component, and a monodentate nitrogenous coupling moiety, said monodentate nitrogenous coupling moiety selected from a pyridinyl moiety and an aminopyridinyl moiety, said monodentate nitrogenous coupling moiety coupling a terminus of said polymeric ligand component and said metallic nanoparticulate substrate component; wherein a nitrogen atom of said monodentate nitrogenous coupling moiety is directly bonded to said metallic nanoparticulate substrate component.

2. (Currently Amended) The composite of claim 1 wherein said metallic nanoparticulate substrate component comprises a nanoparticle selected from CdSe, CdS, CdTe, ZnS, ZnSe, Co and combinations thereof.

3. (Cancelled)

4. (Currently Amended) The composite of claim 1 wherein said polymeric ligand component comprises a component selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly(e-caprolactone), poly(lactide), poly(glycolide), polyglycidyl, polypropylene oxide and combinations thereof.

5. (Currently Amended) The composite of claim 4 wherein said polymeric ligand component comprises a poly(ethylene glycol) component, said polymeric ligand component having an uncoupled terminus comprising a functional group moiety selected from hydroxy, alkyl, alkoxy, carboxylate, thymine, ammonium salt and substituted ammonium salt moieties.

6. (Currently Amended) An emissive complexed nanoparticle composite comprising a CdSe nanoparticle, a polymeric ligand component, and a nitrogenous coupling moiety, said nitrogenous coupling moiety selected from a singe pyridinyl moiety and a single aminopyridinyl moiety, said polymeric ligand component comprising ethylene glycol monomers, said nitrogenous coupling moiety coupling a terminus of said polymeric ligand component and said CdSe nanoparticle; wherein a nitrogen atom of said nitrogenous coupling moiety is directly bonded to said CdSe nanoparticle.

7. (Currently Amended) The composite of claim 6 wherein said polymeric ligand component comprises a poly(ethylene glycol) component having a molecular weight of about 200 to about

5,000.

8. (Currently Amended) The composite of claim 6 wherein said polymeric ligand component comprises about 2 to about 20 ethylene glycol monomers.

9. (Currently Amended) The composite of claim 6 wherein said polymeric ligand component has an uncoupled terminus comprising a functional group moiety selected from hydroxy, alkyl, alkoxy, carboxylate, thymine, ammonium salt and substituted ammonium salt moieties.

10. (Original) The composite of claim 6 wherein said CdSe nanoparticle further comprises a layer thereon selected from ZnS and ZnSe.

11. (Currently Amended) A polymeric compound comprising: a polymeric ligand component, a terminal pyridinyl moiety, and a terminal functional group moiety, said polymeric ligand component comprising a poly(ethylene glycol) component having at least 2 ethylene glycol monomers and a co-polymeric component selected from poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly(e-caprolactone), poly(lactide), poly(glycolide), polyglycidyl, polypropylene oxide and combinations thereof; said terminal pyridinyl moiety boned to said polymeric ligand component via an ether bond linkage or an amine bond linkage, and said terminal functional group moiety selected from hydroxy, alkyl, alkoxy, carboxylate, thymine, ammonium salt and substituted ammonium salt moieties.

12. (Previously Presented) The polymeric compound of claim 11 comprising up to about 100 ethylene glycol monomers.

13. (Cancelled).

14. (Currently Amended) A system for nanoparticulate dispersion, said system comprising:

a composite comprising a nanoparticulate substrate complexed with a first ligand component, said composite in a first liquid medium; and

a second ligand component in a second liquid medium, said second ligand component at least partially soluble in said second liquid medium and comprising a component selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly(e-caprolactone), poly(lactide), poly(glycolide), polyglycidyl, polypropylene oxide and combinations thereof, said second ligand component comprising a terminal nitrogenous coupling moiety.

15. (Original) The system of claim 14 wherein said second ligand component has an affinity for said nanoparticulate substrate greater than said first ligand component.

16. (Currently Amended) The system of claim 15 wherein said second ligand component comprises a terminal pyridinyl coupling moiety.

17. (Currently Amended) The system of claim 16 wherein said second ligand component comprises a poly(ethylene glycol) component and said second liquid medium is aqueous.

18. (Currently Amended) The system of claim 14 wherein said nanoparticulate substrate comprises a CdSe nanoparticle and said second ligand component has a greater affinity for said substrate than said first ligand component.

19. (Currently Amended) The system of claim 18 wherein said second ligand component comprises a poly(ethylene glycol) component and a terminal pyridinyl coupling moiety.

20. (Currently Amended) A method of using ligand solubility to disperse a nanoparticulate substrate, said method comprising:

providing a composite comprising a nanoparticulate substrate complexed with a first ligand component; and

contacting said composite with a second ligand component, said second ligand component in a liquid medium, said second ligand component having a terminal nitrogenous coupling moiety and is at least partially soluble in said medium, said contact with said second ligand component displacing said first ligand component and dispersing said nanoparticulate substrate in said medium.

21. (Currently Amended) The method of claim 20 wherein said nanoparticulate substrate comprises a nanoparticle selected from CdSe, CdS, CdTe, ZnS, ZnSe, Co and combinations

thereof.

22. (Currently Amended) The method of claim 20 wherein said second ligand component comprises a component selected from poly(ethylene glycol), poly(hexaethylene glycol), poly(hexadecylethylene glycol), poly(e-caprolactone), poly(lactide), poly(glycolide), polyglycidyl, polypropylene oxide and combinations thereof.

23. (Currently Amended) The method of claim 22 wherein said second ligand component comprises a poly(ethylene glycol) component.

24. (Currently Amended) The method of claim 22 wherein said terminal nitrogenous coupling moiety is a terminal pyridinyl coupling moiety.

25. (Canceled)

26. (Previously Presented) The method of claim 24 wherein said liquid medium is aqueous and contact with said second ligand component disperses said nanoparticulate substrate therein.

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DETAILED ACTION

Pending Claims

Claims 1, 2, 4-12, 14-24, and 26 are pending.

Response to Applicant's Amendment

1. The rejection of claims 11 and 12 under 35 U.S.C. 102(a) as being anticipated by Billancia et al. (entry A7 on the IDS dated 02/07/2005) has been overcome by Applicant's amendment.

2. The rejection of claims 1-3 under 35 U.S.C. 102(e) as being anticipated by Kambe et al. (US 2002/0192476) has been overcome by Applicant's amendment.

3. The rejection of claims 6-9 under 35 U.S.C. 103(a) as being unpatentable over Billancia et al. in view of Baglin et al. (US 2003/0035887) has been overcome by Applicant's amendment.

Effect of the Examiner's Amendment

4. The rejection of claim 20 under 35 U.S.C. 102(e) as being anticipated by Kambe et al. (US 2002/0192476) has been overcome by the Examiner's amendment.

5. The rejection of claim 21 under 35 U.S.C. 103(a) as being unpatentable over Kambe et al. (US 2002/0192476) in view of Baglin et al. (US 2003/0035887) has been overcome by the Examiner's amendment.

Allowable Subject Matter

6. Claims 1, 2, 4-12, 14-24, and 26 are allowed.

7. The following is an examiner's statement of reasons for allowance:

Regarding claims 1, 2, and 4-10:

Materials similar to the instantly claimed complexed nanoparticles are set forth in a series of patents and publications belonging to Lee or Lee et al. (US 2003/0066998 A1; US Pat. Nos. 6,710,366, 6,794,265, 6,819,845, 6,961,499, 7,020,372, 7,358,525, and 7,402,832). The pre-publication of Lee (US 2003/0066998 A1) will be featured as a representative of these substantive equivalent documents.

The complexed particles of Lee feature (a) a nanoparticle core *(see paragraphs 0076-0077)*; (b) a ligand layer *(see paragraphs 0136-0140 and 0286-0344)*; and (c) molecular tethers *(see paragraphs 0141-0148 and 0348-0354)*. These molecular tethers can be polymeric materials, and the ligands can be bonded to the core through a nitrogen atom *(see paragraphs 0288 & 0340-0344)*. The bonded molecular tethers and ligands of Lee are structurally similar to the bonded polymeric ligands and coupling moieties of the instant invention; however, the teachings of Lee lack the specificity to reasonably teach or suggest a coupling moiety selected from a monodendate (or single) *pyridinyl moiety* and a monodentate (or single) *aminopryidinyl* moiety.

Regarding claims 11 and 12:

Skarzewski et al. disclose a pyridine terminated polymer similar to the one set forth in claims 11 and 12; however, the teachings of Skarzewski et al. lack the specificity to reasonably teach or suggest a *co-polymeric* ligand. It should also be noted that Skarzewski et al. use their pyridine terminated polymers to form complexes with ruthenium; however, the teachings of

Skarzewski et al. lack the specificity to reasonably teach or suggest *nanoparticle* composites featuring a nanoparticle core.

Regarding claims 14-19 and 20-24 & 26,

Lee et al. and Skarzewski et al. represent the closest prior art; however, they fail to reasonably teach or suggest the system of claim 14 *(and dependent claims 15-19)*. They also fail to reasonably teach or suggest the corresponding method of claim 20 *(and dependent claims 21-24 and 26)*.

Any comments considered necessary by applicant must be submitted no later than the payment of the issue fee and, to avoid processing delays, should preferably accompany the issue fee. Such submissions should be clearly labeled "Comments on Statement of Reasons for Allowance."

Communication

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael J. Feely whose telephone number is (571)272-1086. The examiner can normally be reached on M-F 8:30 to 5:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Harold Y. Pyon can be reached on 571-272-1498. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a USPTO Customer Service Representative or access to the automated information system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

/Michael J Feely/
Primary Examiner, Art Unit 1796

March 12, 2009